

## REPORT SUMMARY

### Poplar Island Environmental Restoration Project Expansion Study General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS)

#### STUDY INFORMATION

**Study Authority.** The initial Poplar Island Restoration Project was authorized by Section 537 of the Water Resources Development Act (WRDA) of 1996 to provide for beneficial use of dredged materials from Baltimore Harbor and its approach channels. Section 537 reads as follows.

*The Secretary shall carry out a project for the beneficial use of dredged material at Poplar Island, Maryland, substantially in accordance with, and subject to the conditions described in, the report of the Secretary dated September 3, 1996, at a total cost of \$307,000,000, with an estimated Federal cost of \$230,000,000 and an estimated non-Federal cost of \$77,000,000. The project shall be carried out under the policies and cooperative agreement requirements of section 204 of the Water Resources Development Act of 1992 (33 U.S.C. 2326), except that subsection (e) of such section shall not apply to the project authorized by this section.*

The Baltimore Harbor and Channels (MD and VA) Dredged Material Management Plan (DMMP) and Final Tiered Environmental Impact Statement identified a need for additional dredged material placement capacity. One alternative identified in the DMMP to provide both additional disposal capacity and beneficial use of the dredged material was the expansion of the Poplar Island site. Detailed study of this option was conducted under the authority of Section 204 of WRDA 92, as amended (U.S.C. 2326). That authority provides programmatic authority for selection of a disposal method for authorized projects, that provides aquatic restoration or environmental shoreline erosion benefits when that is not the least costly method of disposal. The incremental cost of the disposal for ecosystem restoration purposes over the least cost method of disposal is cost shared, with a non-Federal sponsor responsible for 25 percent of the costs.

**Study Sponsor.** The non-Federal cost sharing sponsor for the study is the Maryland Port Administration (MPA) of the State of Maryland Department of Transportation.

**Study Purpose and Scope.** The report is an interim response to the programmatic authority. The existing Poplar Island Environmental Restoration project (PIERP) provides for beneficial use of dredged material from the Federal navigation channels serving the Port of Baltimore to restore 1,140 acres of remote island habitat in Chesapeake Bay, Maryland, including 570 acres of tidal wetlands. The purposes of the current study are: (1) to investigate the environmental effects of a lateral and/or vertical expansion to the PIERP to increase habitat restoration and provide additional dredged material placement capacity; (2) to evaluate project enhancements at both the existing PIERP and within the adjacent Poplar Harbor; (3) to evaluate placement of dredged

material from other channels not currently authorized for placement at PIERP; and (4) to determine if there are any remaining actions necessary to complete the existing project. The report also documents compliance with the National Environmental Policy Act (NEPA) for this action.

**Project Location/Congressional District.** The Poplar Island project and study area is located in mid-Chesapeake Bay along the eastern shore in Talbot County, Maryland. (See figure 1.) The study area is located within the 1<sup>st</sup> Congressional district of Maryland and is represented by Wayne T. Gilchrest. The Senators from Maryland are Paul S. Sarbanes and Barbara A. Mikulski.

**Prior Reports and Existing Water Projects.** The PIERP expansion supports dredged material placement for the following navigation projects: 1) the Baltimore Harbor and Channels Federal Navigation Project, under the jurisdiction of the United States Army Corps of Engineers (USACE), Baltimore District; and 2) the Inland Waterway, Delaware River to Chesapeake Bay, Delaware and Maryland, Chesapeake and Delaware (C&D) Canal Project under the jurisdiction of USACE, Philadelphia District.

The PIERP authorization was based on information provided in the *Poplar Island Restoration Study, Maryland: Integrated Feasibility Report and Environmental Impact Statement*. The August 2005 *Baltimore Harbor and Channels Dredged Material Management Plan and Tiered Environmental Impact Statement* recommended the expansion of the PIERP to meet the near-term shortfall of dredged material placement capacity for the Upper Chesapeake Bay Approach Channels to the Port of Baltimore. The PIERP expansion was also identified as a high priority based on dredging needs studies conducted as part of the State of Maryland's Dredged Material Management Program. The results of the *Poplar Island Expansion Beneficial Use of Dredged Material Reconnaissance Report* were used to develop the initial expansion alignment options.

**Federal Interest.** The recommended project provides a combination of ecosystem restoration benefits and increased placement capacity for deep-draft navigation maintenance dredging. Material from the Upper Chesapeake Bay Approach Channels to the Port of Baltimore and the approach channels to the C&D Canal will be beneficially used to restore remote island habitat, including approximately 575 acres of wetland, tidal gut, open water and related upland habitats. The existing project has demonstrated success in using dredged material to create valuable remote island wetland and upland habitat, which is rapidly vanishing in the Chesapeake Bay region. The expansion project will allow USACE and MPA to solve a near-term need for dredged material placement capacity by placing approximately 28 million cubic yards (mcy) of dredged material on approximately 435-acres, expanding the useful life of the disposal site by seven years.

## STUDY OBJECTIVES

**Problems and Opportunities.** More than 130 miles of dredged shipping channels serve the Port of Baltimore. Channel maintenance and improvement projects require that approximately 4-5 mcy of sediment be dredged from the Federal and State channels each year. The State of

Maryland's Dredged Material Management Act of 2001 phases out open water placement of dredged material within Maryland waters by 2010. Along with closure of Hart-Miller Island in 2009, this results in insufficient placement capacity to meet the annual need for maintenance dredging activity after 2009.

Land subsidence, rising sea level, and wave action are causing valuable remote island habitats to be lost throughout the Chesapeake Bay. Through the beneficial use of dredged material, the expansion of the PIERP would replace hundreds of acres of lost wetland and upland remote island habitat. This habitat would improve productivity in the surrounding area, while providing an environmentally sound method for the use of dredged material from the Chesapeake Bay approach channels to the Port of Baltimore.

**Planning Objectives.** The Federal objective of water and related land resources planning is to contribute to national economic development (NED) consistent with protecting the Nation's environment, in accordance with national environmental statutes, applicable executive orders, and other Federal planning requirements. Ecosystem restoration is also a primary mission of the Corps of Engineers Civil Works program. The Corps objective in ecosystem restoration planning is to contribute to national ecosystem restoration (NER). Contributions to national ecosystem restoration (NER outputs) are increases in the net quantity and/or quality of desired ecosystem resources. Other specific planning objectives of the study include:

- restore and enhance marsh, aquatic, and terrestrial island habitat for fish, reptiles, amphibians, birds, and mammals;
- protect existing island ecosystems, including sheltered embayments;
- minimize impacts to existing fisheries nursery, feeding, and protective habitats;
- increase wetlands acreage in the Chesapeake Bay watershed;
- decrease local erosion and turbidity;
- promote conditions to establish and enhance submerged aquatic vegetation;
- promote conditions that support oyster recolonization;
- minimize impacts to rare, threatened, and endangered species and their habitats;
- minimize impacts to existing commercial fisheries;
- minimize establishment of invasive species to maximum extent possible; and
- optimize the site capacity for placement of dredged material.

**Planning Constraints.** Planning constraints included socio-economic, environmental, engineering, legal/policy, and public and agency constraints. The socio-economic constraints required avoiding adverse impacts to surrounding public lands, infrastructure, and property, as well as activities including commercial and recreational fisheries and navigation. Environmental constraints include avoiding quiescent areas in Poplar Harbor and minimizing loss of habitats including shallow water and Bay bottom areas, as well as minimizing impacts to crabbing and shellfish areas. Engineering constraints include reducing costs and resource use by avoiding deep water, restricting the project footprint to areas with suitable foundation material, and restricting borrow areas for dike construction to the alignment footprint and access channel areas. Legal and policy constraints include avoiding adverse impacts to threatened or endangered species, cultural resources, and Natural Oyster Bars (NOBs). Identified public and agency

concerns include avoiding areas used extensively by commercial fishermen, local aesthetic concerns, and a goal of maintaining at least 50 percent wetland habitat within the expansion area.

## ALTERNATIVES

**Plan Formulation Rationale.** Planning followed the principles identified in the *Water Resources Development Act of 1986 and subsequent WRDA acts, and Engineering Regulation 1105-2-100, Policy and Planning, Planning Guidance*. Plan formulation activities were conducted such that the recommended plan would maximize both dredged material placement capacity and the environmental benefits within site-specific constraints. This included analysis of numerous lateral alignments, wetland/upland proportions, and combinations of lateral expansion and vertical dike raising scenarios to meet the project goals of restoring remote island habitat and providing additional placement capacity. Three initial options for expansion were considered: 1) vertical expansion only, 2) lateral expansion only, and 3) lateral expansion plus vertical expansion. Because vertical expansion alone could not efficiently meet the annual capacity need, it was not considered a viable option. Vertical expansion was, however, considered in combination with a lateral expansion to provide sufficient dredged material placement capacity to support proper wetland cell development and efficient placement operations.

For the lateral expansion, six alignments were initially developed and studied as part of a reconnaissance-level assessment, and a seventh alignment was added during the early stages of the plan formulation process. Following the completion of the plan formulation process, a proposal from National Marine Fisheries Service (NMFS) and subsequent discussions with U.S. Environmental Protection Agency - Region III (USEPA), U.S. Fish and Wildlife Service (USFWS), Maryland Department of Natural Resources (MDNR), and Maryland Department of the Environment (MDE) led to the development and evaluation of an open-water embayment that was incorporated into an alternative for the northern lateral alignment.

**Management Measures and Alternative Plans.** Plan formulation was conducted in two primary phases – first, the geographic location of the lateral expansion was determined, then the habitat proportions were optimized within the chosen alignment. A northern lateral alignment consisting of approximately 575 acres was chosen as the optimal geographical location, based on an initial screening process that considered cost, site capacity and life, engineering suitability, environmental resources, and agency and public concerns. A total of six combinations of vertical and/or lateral expansion with variable wetland/upland/open-water habitat proportions for the northern lateral alignment were evaluated based on dredged material placement analysis, environmental benefits determination (ICU calculation), cost effectiveness (CE)/incremental cost analysis (ICA), and agency consultation.

**Final Array of Alternatives.** Based on public input regarding commercial fisheries use and productivity of the area, expansion alignments south of the existing project were eliminated. Other expansion alignments and habitat proportions considered in the plan formulation process were screened out if they did not meet the capacity need, failed to provide a minimum of 50

percent vegetated wetlands, did not provide sufficient environmental benefits, or were not cost effective.

Three action alternatives, in addition to the no-action alternative, were carried forward in the impacts analysis. These included: Alternative 1: a 575-acre lateral expansion with 60 percent wetlands, 40 percent uplands, plus 5-ft vertical expansion; Alternative 2: a 575-acre lateral expansion with 50 percent wetlands, 50 percent uplands, plus 5-ft vertical expansion; and Alternative 3: a 575-acre lateral expansion with 29 percent wetland habitat, 47 percent upland habitat, and 24 percent open-water embayment habitat, plus 5-ft vertical expansion. The no-action alternative consisted of the existing project at its authorized configuration of 1,140 acres at 50 percent wetlands, 50 percent uplands. Alternative 3 is the National Ecosystem Restoration (NER) plan because it provides the greatest environmental benefits for the least cost.

**Comparison of Alternatives.** Each of the alternatives considered met the planning objectives and constraints outlined above. Significant differences between the alternatives included: 1) the impact area footprint of the project, 2) the proportion of wetland/open-water habitat created, 3) the amount of sand borrow required from outside the footprint of the lateral expansion, 4) the additional dredged material placement capacity, and 5) the environmental benefits (ICUs). These differences are summarized in Table 1.

**Table 1 - Comparison of Alternatives Considered for the Poplar Island GRR/SEIS**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>
<b>Impact Area - including toe dike (acres)</b>	600	600	470
<b>Wetland Proportion (% , acres)</b>	60%, 315	50%, 275	29%, 165
<b>Open-Water Embayment Proportion (% , acres)</b>	None	None	24%, 130
<b>Southwestern Borrow Area Required (acres)</b>	91	49	19
<b>Additional Placement Capacity (mcy)</b>	29	30	28
<b>Additional ICUs</b>	9,045	8,118	9,768

Key risks and uncertainties associated with the alternatives included: the constructability of wetland habitat, volume of sand recoverable from identified borrow sources, and revisions/changes to predicted inflow over the expected life of the project. The configuration of the wetland and upland habitat within the lateral expansion was based on lessons learned from the existing PIERP. Constructing wetlands over borrow areas creates uncertainties associated with achieving final design elevations that are necessary for wetland success. Therefore, the uplands in the lateral expansion were located over the borrow areas on the north and eastern side of the northern lateral alignment. To ensure that there will be sufficient sand to construct the

dikes, borrow sources for almost twice the estimated sand borrow volume were identified. To account for changes in predicted inflow over the expected life of the project, each of the alternatives was designed to have enough capacity to meet the projected near-term dredged material capacity shortfall.

The National Economic Development (NED)/NER tradeoff involves a comparison of placement capacity to total environmental benefits of the project. Of the alternatives evaluated, the recommended plan, the alignment with the open-water embayment (Alternative 3), has the least placement capacity (28 mcy), but the greatest number of ICUs (9,768 ICU). However, the recommended plan has additional environmental benefits not accounted for in the ICU analysis – substantially less sand borrow required from outside the footprint of the project (resulting in less impact to Bay bottom habitat) and the potential for greater overall habitat diversity, complexity, and trophic exchange between open-water, wetland, and upland habitats within the project. The overall environmental benefits of the project represent a justifiable tradeoff for the loss of capacity that results from incorporating the open-water embayment into the expansion alignment.

**Key Assumptions.** Several key assumptions were used in the analysis of the alternatives, including: 1) a minimum of 50 percent wetland/open-water habitat in the lateral expansion would be maintained; 2) annual dredged material inflow quantities would be in-line with current projections, 3) the expansion would meet the short-term dredged material placement needs for the Chesapeake Bay approach channels to the Port of Baltimore; 4) estimates of the quantity of usable sand dredged from the sand borrow areas would be accurate; 5) wetland cells would not be constructed on top of areas dredged for sand borrow; and 6) the Island Community Units (ICU) analysis would calculate the environmental benefits for created habitats and would not estimate the value of the habitat lost as a result of construction.

**Recommended Plan.** The recommended plan (Alternative 3) (Figure 1) consists of a 575-acre expansion of the existing PIERP to the north and northeast, comprised of 29 percent wetland habitat (165 acres), 47 percent upland habitat (270 acres), and 24 percent open water habitat (130 acres of open-water embayment habitat plus 10 acres of tidal gut habitat); plus a vertical expansion component consisting of a 5-ft raising of the upland cells of the existing Poplar Island project to support habitat development in the expansion area. This alternative provides approximately 28 mcy of dredged material placement capacity and extends the life of the existing PIERP project by approximately seven years. Alternative 3 was chosen as the recommended plan because it provided sufficient dredged material capacity to help meet the near-term capacity need, impacted the minimum amount of borrow area outside of the lateral expansion footprint (19 acres), was the most cost-effective alternative (the NER plan), and resulted in the greatest environmental benefits (9,768 ICU).

Based on the analysis for the Poplar Island expansion, operations of the expansion and existing project will be modified to include the placement of dredged material from the southern approach channels to the C&D Canal south of the Sassafra river and also placement of dredged material from other Federal navigation channels at the PIERP.

The report also addresses in detail activities required to complete the existing project, which were anticipated in the original authorized plan, but were not sufficiently detailed to satisfy NEPA requirements. These features include raising the existing temporary upland dikes from +23 ft MLLW to +25 ft MLLW to allow for placement and consolidation of the dredged material necessary to reach the final upland target elevations; the restoration of internal borrow sites within Cell 4 and the construction of temporary cross dikes in Cell 5; and constructing new discharge, pier, and bulkhead structures to accommodate the closure of Cell 6.

As the various elements of the restoration project are constructed, existing structures and facilities will be adapted to accommodate passive recreational and/or educational uses compatible with the project's ecosystem restoration purpose and objectives. The existing boat dock facilities could become an integral part of future recreation at the PIERP. Additional recreation and education components of the plan include: kiosks with informative signage, self-guided/interpretive nature trails and boardwalks, avian observation areas, picnic areas, and other resting/viewing areas. These facilities could support volunteer opportunities to participate in environmental stewardship, such as bird census and research opportunities, as well as research opportunities for educational institutions. Additional recreation opportunities could present themselves as the PIERP construction is completed. An adaptive management process would be used to identify the most appropriate location for the proposed recreation facilities.

**Systems/Watershed Context.** The PIERP expansion will restore additional remote island habitat, a scarce and rapidly vanishing ecosystem niche within the Chesapeake Bay region. Loss of remote island habitat within the Chesapeake Bay has been estimated at approximately 10,000 acres in the last 150 years, a trend that will continue due to erosive forces and sea level rise. Even though habitats are not fully developed and site operations are on-going at the PIERP, multiple species have already begun to nest at the existing project, including Least Terns; Common Terns; Snowy Egrets; Willets; Black Ducks; Osprey; and diamondback terrapins. Remote islands such as the PIERP provide a vital connection between open-water and mainland terrestrial habitats within the region. Remote islands in the Chesapeake Bay serve as an important stop-over point for migratory avian species, providing forage and protected resting habitat during spring and fall migration for many shorebird and waterbird species. Many migratory species have been identified utilizing the habitats at the PIERP, including Dunlin, Sanderlings, Semipalmated and Least Sandpipers, Greater and Lesser Yellowlegs, Forster's Terns, and Black Terns. For aquatic species, remote islands such as Poplar Island increase the potential for commercially important large predator finfish species (such as bluefish, striped bass, and Atlantic croaker) to utilize the habitat because of their proximity to deep open water as opposed to the shallows adjacent to mainland marshes.

The lateral and vertical expansion will provide additional important foraging habitat for special status species such as the Federally-listed Bald Eagle, which nests on Coaches Island adjacent to the project. Bird islands specifically designed to encourage nesting by State-listed Least Terns are planned for the wetland cells of the lateral expansion. In addition, several State-listed avian species including Royal Terns; American Oystercatchers; Northern Harriers; and the Spotted Sandpiper, have been observed utilizing the habitat at the PIERP.

The expansion of the PIERP is an integral component of the Federal DMMP which is a long-term regional plan for managing sediments from the Chesapeake Bay Federal navigation channels. The significance of the fish and wildlife resources of the Chesapeake Bay is widely recognized by resource agencies, the public, and academic institutions. For more than 20 years, extensive efforts have been expended to support natural resources management and restoration plans in the Chesapeake Bay region. The lateral and vertical expansion of the PIERP would continue the contribution of the existing project to the goals of the Chesapeake Bay Program watershed partnership through its habitat and ecosystem recovery and preservation efforts. In 2003, the PIERP received the Coastal America Partnership Award in recognition of the partnership among federal, state and local governments. This nationally-recognized partnership will continue throughout implementation of the expansion project.

**Environmental Operating Principles.** The plan recommended by the Poplar Island GRR/SEIS supports each of the seven USACE Environmental Operating Principles. The recommended plan will *strive to achieve environmental sustainability* by creating a diverse, productive ecosystem to replace rapidly vanishing remote island habitats, including sheltered open-water, vegetated wetlands, intertidal zones, uplands, and bird islands, that will be utilized by a wide variety of terrestrial and aquatic species. The recommended plan *recognizes the interdependence of life and the physical environment* by creating habitats representative of typical wetland and uplands in the Chesapeake Bay region that will promote interaction and exchange with the surrounding ecosystems. The recommended plan *seeks balance and synergy among human development activities and natural systems* by managing sediments that originate from land use practices within the watershed, by maintaining consistency with the existing aesthetics of the region, and by promoting recreational and educational use of the project. By implementing the recommended plan, the Corps will *accept responsibility and accountability under the law* to ensure that the project complies with all applicable Federal laws, continues extensive environmental monitoring, and utilizes adaptive management practices. The recommended plan *seeks ways and means to assess and mitigate cumulative impacts to the environment* by minimizing environmental consequences to important regional resources, such as open-water, shallow water, and Bay bottom habitats, while providing direct and indirect environmental benefits through creation of scarce island wetland and upland habitats. Since the inception of the PIERP, the Poplar Island Work Group, which is comprised of a diverse group of stakeholders, has provided oversight and technical expertise to the Project Delivery Team (PDT), allowing them to *listen to, respect, and learn from the perspectives of individuals and groups interested in Corps activities*. The PDT has worked with these stakeholders to develop a win-win solution – a recommended plan that meets the dredged material capacity need while minimizing impacts to natural resources, preserving open-water habitat, and maximizing environmental benefits. Through extensive and on-going consultation with the Work Group, and coordination and outreach with other Federal and State agencies, scientific experts from universities, local government, and the public, the recommended plan will continue to *build and share an integrated scientific, economic, and social knowledge base*.

**Independent Technical Review.** The U.S. Army Corps of Engineers Philadelphia District provided the technical reviewed for the Poplar Island GRR/SEIS document - prior to the release of the Draft document and prior to the release of the Final document. The majority of the



comments focused on clarifications related to the alternative screening process, cost effectiveness/incremental cost analysis, island community units analysis, and selection of the recommended plan. Other significant comments included the need for subsequent hydrodynamic studies to support the open-water embayment, breakwater/reef structure and evaluating alternate rock toe dike designs during PED or as a value engineering option. These comments were addressed in subsequent versions of the document. Also, researchers at USACE-Engineering Research and Design Center's (ERDC) Coastal Hydraulic Laboratory conducted various hydrodynamic modeling and life-cycle design modeling to support the report recommendations.

## EXPECTED PROJECT PERFORMANCE

**Project Costs.** Table 2 displays the estimated project costs at October 2005 price levels and interest rates to facilitate comparison with other projects considered for authorization. The table includes information on the existing Poplar Island project, as the two facilities will be operated as a single management area and the expansion project builds upon the existing project to maximize habitat development through use of both dredged material placement capacity and long term operations.

**TABLE 2 - PROJECT FIRST COSTS**  
(October 2005 Price Levels)

Feature	Existing Project	Expansion	Total
Pre-Construction Costs (Fed)	\$1,800,000	\$0	\$1,800,000
Phase I Dike Construction	\$56,800,000	\$0	\$56,800,000
Phase II Dike construction	\$40,300,000	\$0	\$40,300,000
Underdrains	\$2,100,000	\$0	\$2,100,000
Incremental Dike Raising	\$12,100,000	\$0	\$12,100,000
Work-In-Kind	\$40,300,000	\$22,600,000	\$62,900,000
Environmental Monitoring	\$10,800,000	\$3,900,000	\$14,700,000
Access Channel	\$1,900,000	\$0	\$1,900,000
Access Channel Closure	\$10,700,000	\$0	\$10,700,000
Site Development/Support Buildings	\$7,400,000	\$0	\$7,400,000
Dike Construction (Expansion)	\$0	\$91,300,000	\$91,300,000
Habitat Development	\$42,300,000	\$19,800,000	\$62,100,000
Expansion GRR	\$2,500,000	\$0	\$2,500,000
Hurricane Isabel Repairs	\$1,300,000	\$0	\$1,300,000
Recreation Features	\$0	\$600,000	\$600,000
Construction Management	\$6,600,000	\$6,200,000	\$12,800,000
Engineering, and Design	\$20,700,000	\$16,700,000	\$37,400,000
Incremental Dredging Costs	\$129,100,000	\$95,600,000	\$224,700,000
<b>Total Project Costs</b>	<b>\$386,700,000</b>	<b>\$256,700,000</b>	<b>\$ 643,400,000</b>

Notes: 1) Includes sunk costs through 30 Sept 2005: \$196,751,667

2) After dike construction for the expansion is complete, the project will be developed as a single unit and the costs will not be separable.

**Equivalent Annual Costs And Benefits.** Table 3 provides a summary of the average annual project costs and expected project benefits. Environmental benefits are displayed in ICUs, which were developed for use in determining the environmental benefits of island restoration projects in the Mid-Chesapeake Bay region.

**TABLE 3 - ECONOMIC COSTS AND BENEFITS OF PROJECT  
(EXISTING PROJECT PLUS RECOMMENDED PLAN) <sup>1</sup> (\$1,000)**

Item	Ecosystem		Recreation		Total	
	Allocated Costs	Benefits	Allocated Costs	Benefits	Allocated Costs	Benefits
<b>Investment Cost</b>						
First Cost	\$642,800		\$600		\$643,400	
Interest During Construction	\$43,771		\$8		\$43,779	
Total	\$686,571		\$608		\$687,179	
<b>Average Annual Cost</b>						
Interest and Amortization	\$38,337		\$34		\$38,337	
OMRR&R <sup>2</sup>			\$5			
Subtotal	\$38,337		\$39		\$38,337	
<b>Annual Benefits</b>						
Non-monetary (Ecosystem)		557 ICUs		\$133		\$133 and 557 ICUs

<sup>1</sup>Based on October 2005 price levels, 5.125 percent rate of interest, and a 50-year period of analysis.

<sup>2</sup>Operation, Maintenance, Repair, Replacement, and Rehabilitation: Project OMRR&R cost estimate will be generated as part of O&M plan currently under development. Annual OMRR&R cost expected to be 2% or less of total project cost based on the actual costs to date. Minimal OMRR&R costs have been incurred at existing Poplar Island project since start of dike construction in 1998.

**Cost Sharing.** The total project cost at October 2005 price levels for the PIERP, including the expansion, is an estimated \$642.8 million, which is cost shared 75 percent Federal, 25 percent non-Federal. The cost for the PIERP, as currently authorized, is \$386.7 million; and the estimated cost for the recommended plan for the lateral and vertical expansion of the PIERP is \$256.1 million. The recommended plan for the lateral and vertical expansion of the PIERP is to be cost-shared \$192.1 million for the Federal government (75 percent) and \$64 million for the non-Federal sponsors (25 percent). Project costs for the recreation features is cost shared 50 percent Federal (\$300,000) and 50 percent non-Federal (\$300,000). The total project cost does not include approximately \$6.4 million in costs for project betterments, which are to be paid for 100 percent by the non-Federal sponsor. Under the existing Project Cooperation Agreement (PCA), the MPA (the non-Federal sponsor) has contributed approximately \$59.3 million in cash and in-kind services to support the project, to date. The total, fully-funded project cost for the PIERP, including the expansion, is an estimated \$758.7 million.

**Project Implementation.** The MPA, the non-Federal sponsor, will provide 25 percent of the cost associated with construction of the project, including provision of all lands, easements, rights-of-way, and necessary relocations; and will pay 100 percent of the operation, maintenance, replacement and rehabilitation costs associated with the project. For the recreational components, economically justified facilities will be cost shared 50 percent Federal and 50 percent non-Federal. The non-Federal sponsor may receive credit, but not to exceed 25 percent of the total project costs, towards its share of the total project costs for design and construction work performed by the non-Federal sponsor, or by a State or local agency on behalf of the non-Federal sponsor subsequent to or prior to execution of the PCA.

Environmental monitoring needs for the existing PIERP have been identified by a multi-disciplinary group of State and Federal regulatory and resource agencies. The existing monitoring framework would be expanded to include the lateral and vertical expansion of PIERP based on consultation with the appropriate agency representatives. Changes and updates to the monitoring framework will be evaluated as part of the Adaptive Management Plan (AMP) for the existing project.

**Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R).** As each functional component of the project is completed and determined to be functioning as intended, it will become the responsibility of MPA to operate, maintain, repair, replace, and rehabilitate as needed. Such functional components include the containment dikes, internal dikes, spillways, service structures, access channels, each of the constructed wetland and upland habitat cells, and the recreation features. Based on experience at the existing project, operations and maintenance costs when the PIERP is completed are projected to be less than 2 percent of the total project cost. An operation and maintenance plan for the project is currently under development and will provide detailed requirements and cost estimates.

**Key social and environmental factors.** Expansion of Poplar Island will meet the near-term dredged material placement capacity needs allowing the deep-draft shipping channels to the Port of Baltimore to remain open and navigable and at the same time restore approximately 575 acres of remote island habitat consisting of wetlands, uplands, and protected open water in the Chesapeake Bay. The expansion was designed to provide direct protection to Poplar Harbor from northeast wind and wave action, and create quiescent conditions for growth of submerged aquatic vegetation (SAV). The interaction and trophic exchange between the embayment and adjacent wetlands is expected to result in a beneficial impact to avian, fish, and wildlife species, including essential fish habitat (EFH) species, blue crabs, diamondback terrapins, and juvenile estuarine fish. The lateral expansion will provide additional protection to the Eastern Shore of Maryland mainland, Jefferson Island, and Coaches Island from erosion.

The lateral expansion will result in a loss of approximately 470 acres of Chesapeake Bay bottom within the project footprint, including crabbing habitat, open-water habitat, and shallow water habitat. The expansion alignment was sited to avoid crabbing and sensitive resource areas south of the existing project. Finfish, blue crabs, and avian species that utilize the area within the lateral expansion footprint will be displaced, but comparable habitat is located adjacent to the project area. Sand borrow from outside the footprint of the lateral expansion and dredging of

access channels will disturb approximately 291 acres of Bay bottom and will deepen the bathymetry of borrow areas located south and southwest of the existing project. The USACE will design a dredging plan in consultation with resource agencies to minimize the disturbance area and reduce the risk for anoxia or hypoxic conditions that could be detrimental to aquatic resources. The lateral and vertical expansion will create a permanent viewshed change from the adjacent Eastern Shore of Maryland, Jefferson Island, and Coaches Island; and increases in noise and light levels will impact residents and visitors to Coaches and Jefferson Island, primarily during the initial two construction seasons when the exterior dikes are constructed and the existing upland cells are raised.

In combination with the existing PIERP, other proposed restoration and/or protection projects in the Mid-Chesapeake Bay (i.e., James Island, Barren Island, Smith and Tangier Islands), and with proposed Dorchester County wetland restoration, the PIERP expansion contributes to a restoration potential totaling approximately 3,571 acres of wetlands and approximately 1,770 acres of uplands within a region where over 10,000 acres of remote island habitat have been lost.

**Stakeholder perspectives and differences.** Coordination with agencies and technical experts from academic institutions was an integral and continuous part of the Poplar Island expansion study. The PDT was directed by the USACE-Baltimore District (lead agency) and by the MPA (local sponsor), and included personnel from agencies including MDE, MDNR, Maryland Environmental Services, Maryland Geological Survey (MGS), National Oceanic and Atmospheric Administration, NMFS, USEPA, USFWS, U.S. Geological Survey, U.S. Environmental Protection Agency - Chesapeake Bay Program, University of Maryland Center for Environmental Science (UMCES) – Horn Point Environmental Laboratory, UMCES – Chesapeake Biological Laboratory, Ohio University, Anne Arundel Community College, and USACE- Philadelphia District. In addition, various other private-interest groups and organizations that are stakeholders in the Bay, such as the Talbot County Council, Talbot County Department of Parks and Recreation, Coastal Conservation Association, Citizen's Advisory Committee, conservation groups, sportsmen, boaters, and watermen were also involved in the development of the recommended plan.

Throughout the study process public outreach has been, and continues to be, a high priority. Generally, public support for this project is strong. A *Notice of Intent* was published in the Federal Register on June 5, 2003, and two public scoping meetings for the GRR/SEIS were held in January 2004. Between March 2004 and April 2005, several additional informal meetings were held with interest groups and civic organizations with particular interest in the project and approximately 1,500 people toured the project over the past year. The local watermen were specifically targeted for involvement in the process and significant efforts were made to accommodate their concerns. The *Notice of Availability* for the Draft GRR/SEIS was published in the Federal Register on June 24, 2005, and the Draft GRR/SEIS was issued to almost 900 participants, including Federal, State and local agencies, local libraries, and private citizens. Two public meetings were held in July 2005.

Federal and State resource agencies supported the inclusion of an open-water embayment within the recommended plan, even though the recommended size of the open-water embayment varied

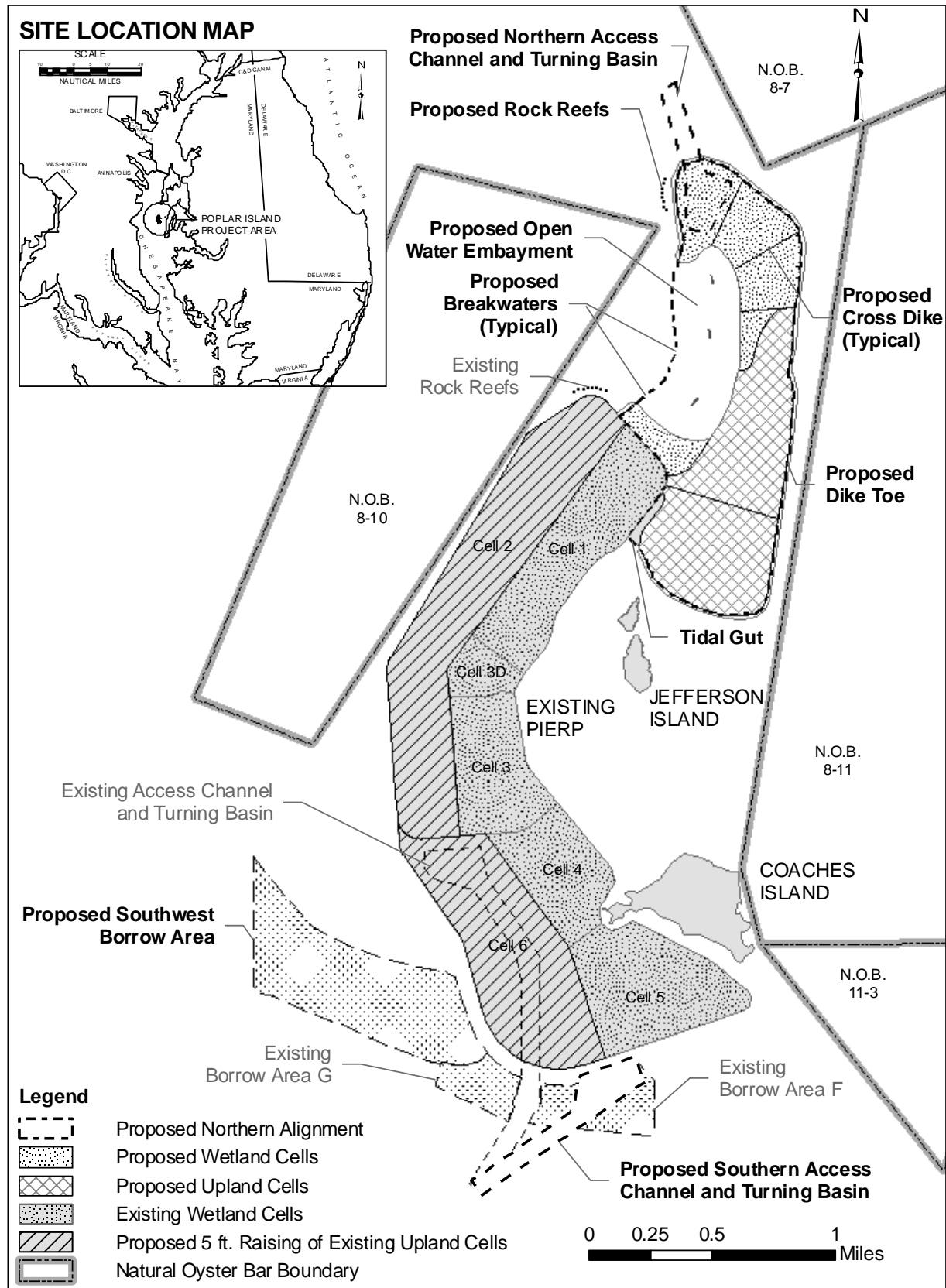
by resource agency (NMFS recommended approximately 130 acres in size; USFWS recommended between 80-90 acres in size). The State agencies raised issues regarding the location of the embayment and long-term maintenance costs. The open-water embayment was incorporated into the recommended plan, contingent on additional evaluation including: additional sizes and locations for the embayment; hydrodynamic and hydraulic modeling; analysis of erosion and debris accumulation risk; stability and function; protection of wildlife; habitat enhancements; access for public, commercial watermen; and long-term maintenance. Resource and regulatory agencies will be invited to participate and provide continued input during the next design phase of the project.

The MPA expressed concerns regarding limitations associated with creating uplands over borrow areas. The MPA believes that wetlands can successfully be created over borrow areas and has requested continued study and discussions regarding the concept. The Maryland Watermen's Association expressed concern regarding the loss of crabbing areas within the expansion footprint and southwestern borrow area. The MPA is coordinating with the MDNR to define and locate additional crabbing areas to replace the area that will be lost within the expansion footprint.

Jefferson Island L.L.C. expressed concerns regarding viewshed and noise and light-related impacts associated with the expansion. The majority of noise and light impacts will be associated with the exterior dike construction and dike raising which is anticipated to be completed within two construction seasons. Noise and light impacts related to dredged material inflow, de-watering, and cell development will occur until approximately 2022, and will be of the same magnitude as existing operations but will be of substantially less magnitude than construction.

Resource agencies, particularly NMFS, expressed concern regarding dredging activity in the southwestern borrow area and the potential for creating an area that could be prone to anoxia or hypoxic conditions. The USACE will utilize as much of the required sand as possible from within the expansion footprint and will coordinate with NMFS and other agencies to minimize the disturbance to the southwestern borrow area and to conduct dredging in a manner that will maintain water circulation with adjacent deep areas.

The public expressed concern regarding future continued expansion of Poplar Island. USACE policy requires an assessment of expansion and maximization of existing sites first if the USACE is in need of placement capacity. Future lateral expansion of the PIERP is geographically unlikely, based on the existing environmental and engineering constraints at the site.



**Figure 1. Poplar Island Environmental Restoration Project: Site Location Map and Recommended Plan for Lateral and Vertical Expansion**